CPT – December 2018 Question Paper (Compiled By :- VSI, Jaipur. Based on Memory)

Marks 100 **Time : 2 Hours**

Business Mathematics and Logical Reasoning & Statistics

01. $\frac{3x-2}{5x+6}$ is the duplicate ratio of $\frac{2}{3}$ then find the value of x:

(a) 2 (b) 6

(c) 5 (d) 9

02. $\frac{2^{m+1} x 3^{2m-n+3} x 5^{n+m+4} x 6^{2n+m}}{6^{2m+n} x 10^{n+1} x 15^{m+3}}$

(a) $3^{2m - 2n}$ (b) $3^{2n - 2m}$

(c) 1 (d) None of the above

03. If x : y : z = 7 : 4 : 11 then $\frac{x+y+z}{z}$ is:

(a) 2 (b) 3

(c) 4 (d) 5

04. $\log_2 \log_2 \log_2 16$ = ?

(a) 0 (b) 3

(c) 1 (d) 2

05. A man invests an amount of ₹ 15860 in the names of his three sons A, B and C in such a way that they get the same amount after 2, 3 and 4 years respectively. If the rate of interest is 5% then ratio of amount invested in the name of A,B and C is

(a) 6:4:3 (b) 30:12:5

(c) 3:4:6 (d) None of the above

06. When two roots of quadratic equation are α, $\frac{1}{\alpha}$ then what will be the quadratic equation:

(a) $\alpha x^2 - (\alpha^2+1)x + \alpha = 0$ (b) $\alpha x^2 - \alpha^2 x+1 = 0$

(c) $\alpha x^2 - (\alpha^2+1)x + 1 = 0$ (d) None of these

07. Let α and β be the roots of $x^2 + 7x + 12 = 0$. Then the value of $\left(\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}\right)$ will be

(a) $\frac{49}{144} + \frac{144}{49}$ (b) $\frac{7}{12} + \frac{12}{7}$

(c) $-\frac{91}{12}$ (d) None of the above

08. If A = $\begin{bmatrix} -5 & 2 \\ 1 & -3 \end{bmatrix}$, then adj A is

(a) $\begin{bmatrix} -3 & -2 \\ -1 & -5 \end{bmatrix}$ (b) $\begin{bmatrix} 5 & 1 \\ 2 & 3 \end{bmatrix}$

(c) $\begin{bmatrix} 3 & -2 \\ -1 & 5 \end{bmatrix}$ (d) $\begin{bmatrix} 3 & 2 \\ 1 & 5 \end{bmatrix}$

09. **If A = $\begin{bmatrix} 5 & x \\ y & 0 \end{bmatrix}$ and A=A^T, then**

(a) $x = 0, y = 5$ (b) $x = y$

(c) $x + y = 5$ (d) None of these

10. **Let A^T be the transpose of matrix A having order $m \times n$,then A^T A is a matrix of order**

(a) $n \times n$ (b) $m \times m$

(c) $m \times n$ (d) $n \times m$

11. **On Solving the Inequalities 5x + y ≤ 100, x + y ≤ 60, x ≥ 0, y ≥ 0, we get the following situation:**

(a) (0, 0), (20, 0), (10, 50) & (0, 60) (b) (0, 0), (60, 0), (10, 50) & (0, 60)

(c) (0, 0), (20, 0), (0, 100) & (10, 50) (d) None of these

12. **If ₹ 10,000 is invested at 8% per year compound quarterly, then the value of the investment after 2 years is [given $(1+ 0.2)^8$–1.171659]**

(a) ₹10,716.59 (b) ₹11,716.59

(c) ₹117.1659 (d) None of the above

13. **A bank pays 10% rate of interest, interest being calculated half yearly. A sum of ₹ 400 is deposited in the bank. The amount at the end of 1 years will be**

(a) ₹439 (b) ₹440

(c) ₹442 (d) ₹441

14. **A certain money doubles itself in 10 years when deposited on simple interest. It would triple itself in**

(a) 30 years (b) 20 years

(c) 25 years (d) 15 years

15. **A men deposited ₹8,000 in a bank for 3 years at 5% per annum compound interest, after 3 years he will get**

(a) ₹9,000 (b) ₹8,800

(c) ₹9,200 (d) ₹9,261

16. **If in two years time a principal of ₹100 amounts to ₹121 when the interest at the rate of *r*% is compounded annually, then the value of *r* will be**

(a) 14 (b) 10.5

(c) 15 (d) 10

17. **A certain sum of money Q was deposited for 5 year and 4 months at 4.5% simple interest and amounted to ₹248, then the value of Q is**

(a) ₹240 (b) ₹200

(c) ₹220 (d) ₹210

18. **The effective rate of interest for one year deposit corresponding to a nominal 7% rate of interest per annum convertible quarterly is**

(a) 7% (b) 7.4%

(c) 7.5% (d) 7.18%

19. **How much will ₹ 25,000 amount to in 2 years at compound interest if the rates for the successive years are 4% and 5% per year**

(a) ₹27,000 (b) ₹27,300

(c) ₹27,500 (d) ₹27,900

20. **₹ 8,000/- at 10% per annum interest compounded half yearly will become at the end of one year**

(a) ₹ 8,800/- (b) ₹ 8,900/-

(c) ₹ 8820 (d) ₹ 9,600

21. **The value of furniture depreciates by 10% a year, if the present value of the furniture in an office is ₹ 21870, calculate the value of furniture 3 years ago**

(a) ₹ 30,000 (b) ₹40,000

(c) ₹ 35,000 (d) ₹50,000

22. **If compound interest on a sum for 2 years at 4% per annum is ₹102, then the simple interest on the same period at the same rate will be**

(a) ₹ 90 (b) ₹ 100

(c) ₹ 101 (d) `93

23. **If the difference between the compound interest compounded annually and simple interest on a certain amount at 10% per annum for two years is ₹ 372, then the principal amount is**

(a) ₹ 37,000 (b) ₹ 37,200

(c) ₹ 37,500 (d) None of the above

24. **What is the net present value of piece of property which would be valued at ₹2 lakh at the end of 2 years? (Annual rate of increase = 5%)**

(a) ₹ 2.00 lakh (b) ₹ 1.81 lakh

(c) 2.01 lakh (d) None of the above

25. **The number of words from the letters of the word BHARAT, in which B and H will never come together, is**

(a) 120 (b) 360

(c) 240 (d) None of the above

26. **The value of *N* in $\frac{1}{7!}+\frac{1}{8!}=\frac{N}{9!}$ is**

(a) 81 (b) 64

(c) 78 (d) 89

27. **If ${}^{n}P_{r} = 720$ and ${}^{n}C_{r} = 120$ then r is**

(a) 4 (b) 5

(c) 3 (d) 6

28. **A bag contains 4 red, 3 black and 2 white balls. In how many ways 3 balls can be drawn from this bag so that they include at least one black ball?**

(a) 46 (b) 64

(c) 86 (d) None of the above

29. **If the p^{th} term of an A.P. is 'q' and the q^{th} term is 'p', them its rth term is**

(a) $p + q + r$ (b) $p + q - r$

(c) $p - q - r$ (d) $p + q$

30. **The 3rd term of a G.P. is $\frac{2}{3}$ and the 6th term is $\frac{2}{81}$, then the 1st term is**

(a) 2 (b) 6

(c) 9 (d) $\frac{1}{3}$

31. **The sum of the series –8, –6, –4,...n terms is 52. The number of terms n is**

(a) 10 (b) 11
(c) 13 (d) 12

32. **The value of K, for which the terms $7K + 3, 4K - 5, 2K + 10$ are in A.P., is**

(a) –13 (b) –23
(c) 13 (d) 23

33. **A is {1,2,3,4} and B is {1,4,9,16,25} if a function f is defined from set A to B where f(x) = x^2 then the range of f is:**

(a) {1,2,3,4} (b) {1,4,9,16}
(c) {1,4,9,16,25} (d) None of these

34. **If A = {1,2} and B = {3, 4}. Determine the number of relations from A and B:**

(a) 3 (b) 16
(c) 5 (d) 6

35. **If A = {1,2,3,4,5,6,7} and B = {2, 4,6,8}. Cardinal number of A - B is:**

(a) 4 (b) 3
(c) 9 (d) 7

36. **Identity the function from the following:**

(a) {(1,1), (1,2), (1,3)} (b) {(1,1), (2,1), (2,3)}
(c) {(1,2), (2,2), (3,2), (4,2)} (d) None of these

37. **Let $x = at^3, y = \frac{a}{t^2}$, Then $\frac{dy}{dx}$**

(a) $\frac{-3a}{t^6}$ (b) $\frac{-1}{t^6}$

(c) $\frac{1}{3at^2}$ (d) None of the above

38. **xy = 1 then $y^2 + \frac{dy}{dx}$ = ?**

(a) 1 (b) 0
(c) 2 (d) None of the above

39. $\int x\left(x^2+4\right)^5 dx$ **is equal to**

(a) $\frac{1}{12}(x^2+4)^6 + c$ (b) $(x^2+4)^6 + c$

(c) $\frac{1}{6}(x^2+4)^6 + c$ (d) None of the above

40. $\int_{-1}^{3}(1 + 3x - x^3)\, dx$ **is equal to**

(a) –3 (b) –4
(c) 3 (d) 4

41. **If PLAY is coded as 8123 and RHYME is coded as 49367. What will be code of MALE?**

(a) 6285 (b) 6217
(c) 6395 (d) 6198

42. **Find out the next number in the following series 7,11,13,17,19,23,25,29,?**

(a) 33 (b) 30
(c) 32 (d) 31

43. If HONEY is coded as JQPGA, which word is code as VCTIGVU?

(a) CARPETS (b) TRAPETS
(c) UMBRELU (d) TARGETS

44. Find odd man out of the following series
15,21,63,81,69

(a) 15 (b) 21
(c) 81 (d) 63

45. Find odd man out of the following series
7, 9, 13, 17, 19.

(a) 9 (b) 7
(c) 13 (d) 19

46. Rahim started from point X and walked straight 5 km. West, then turned left and walked straight 2 km and again turned left and walked straight 7 km. In which direction is he from the point X?

(a) North-East (b) South-East
(c) South-West (d) North-West

47. A man started to walk East. After moving a certain distance, he turns to his right. After moving some distance, he turns to his right again. After moving a little he turns now to his left currently, he is going in ……. Direction.

(a) North (b) East
(c) West (d) South

48. Manu wants to go to the market. He starts from his house towards North reaches at a crossing after 30m. He turns towards East, goes 10m till the second crossing and turns again, moves towards South straight for 30m where marketing complex exits. In which direction is the market from his house?

(a) North (b) West
(c) South (d) East

49. Anoop Starts walking towards South after walking 15 meters he turns towards North. After walking 20 meters he turns towards East and walks 10 meters. He then turns towards south and walks 5 meters. In which direction is he from the original position.

(a) East (b) South
(c) West (d) North

50. Pointing to man in a photograph, a woman said "the father of his brother is the only son of my grandfather", how is the woman related to the man in the photograph?

(a) Mother (b) Daughter
(c) Aunty (d) Sister

51. Six Persons are seen together in a group. They are A, B, C, D, E and F. B is brother of D, but D is not brother of B. F is brother of B. C and A are married together. F is son of C, but C is not mother of F. E is brother of A. The number of female member in the group is

(a) 1 (b) 2
(C) 3 (D) 4

52. Ram and Mohan are brothers, Shankar is Mohan's father. Chhaya is Shankar's sister. Priya is shankar's niece. Shubhra is Chhaya's granddaughter. Then, Ram is Shubhra's

(a) Brother (b) Uncle
(c) Cousin (d) Nephew

53. If P + Q means P is the mother of Q, P ÷Q means P is the father of Q, P - Q means P is the sister of Q. Then which of the following relationship shows that M is the daughter of R?

(a) R÷M+N (b) R+N÷M
(c) R-M÷N (d) None of these

54. Five students A, B, C, D and E are standing in a row. D is on the right of E, B is on the left of E but on the right of A. D is next to C on his left. The student in middle is

(a) B (b) A
(c) E (d) C

55. Six flats on a floor in two rows facing North and South are allotted to P, Q, R, S, T and U. If Q gets a North facing flat and is not next to S. S and U get diagonally opposite flat. R next to U gets a South facing flat and T gets a North facing flat. Whose flat is between Q and S?

(a) P (b) T
(c) R (d) U

56. Eight persons A, B, C, D, E, F, G and H are sitting in a line. E Sits second right to D. H sits fourth left to D. C and F are immediate neighbors, but C is not immediate neighbor of A. G is not neighbor of E. Only two persons sit between A and E. The persons on left and right end respectively are

(a) G and B (b) G and E
(c) H and E (d) B and E

57. Six children A, B, C, D, E and F are sitting in a row. B is between F and D. E is between A and C. However, A does not sit next to F or D. C does not sit next to D. Then, F is sitting between.

(a) B and D (b) B and C
(c) E and C (d) None of the above

58. Directions (27-29) : Each of the following question contains two statements followed by two conclusions number I and II. You have to decide which of the given conclusions definitely follows from the given statements.

Statements:

1. Some phones are watches
2. All watches are guns

Conclusions :

I. All guns are watches
II. Some guns are phones.

(a) Only conclusion I follows (b) Only conclusion II follows
(c) Neither I nor II follows (d) Either I or II follows

59. Statements:

1. Some books are pens
2. No pen is pencil

Conclusions :

I. Some books are pencil
II. No book is pencil

(a) Only conclusion I follows (b) Only conclusion II follows
(c) Either I or II follows (d) Neither I nor II follows

60. Statements:

1. Some players are singers
2. All singers are tall

Conclusions :

I. Some players are tall
II. All players are tall

(a) Only conclusion I follows (b) Only conclusion II follows
(c) Either I or II follows (d) Neither I nor II follows

61. The following frequency distribution

X:	12	17	24	36	45
Y:	2	5	3	8	9

is classified as:

(a) Discrete distribution (b) Continuous distribution
(c) Cumulative frequency distribution (d) None of the above

62. Histogram is useful to determine graphically the value of

(a) Arithmetic mean (b) Mode
(c) Median (d) None of the above

63. Data are said to be _____ if the investigator himself is responsible for the collection of the data.

(a) Primary data (b) Secondary Data
(c) Mixed of primary and secondary data (d) None of the above

64. A suitable graph for representing the portioning of total into sub parts in statistics is

(a) A pictograph (b) A Pie Chart
(c) An ogive (d) Histogram

65. The number of times a particular items occurs in a class interval is called its

(a) Mean (b) Cumulative frequency
(c) Frequency (d) None of the above

66. An ogive is a graphical representation of

(a) Cumulative frequency distribution of (b) Ungrouped data
(c) A frequency distribution (d) None of the above

67.

Class	0–10	10–20	20–30	30–40	40–50
Frequency	4	6	20	8	3

For the class 20-30, cumulative frequency is

(a) 26 (b) 10
(c) 41 (d) 30

68. If the mean of the following distribution is 6 then the value of P is

X:	2	4	6	10	P + 5
F	3	2	3	1	2

(a) 7 (b) 5
(c) 11 (d) 8

69. If total frequencies of three series are 50,60 and 90 and their means are 12, 15 and 20 respectively, then the mean of their composite series is

(a) 15.5 (b) 16
(c) 14.5 (d) 16.5

70. If the variance of 5, 7, 9 and 11 is 4, then the coefficient of variation is

(a) 25 (b) 15
(c) 17 (d) 19

71. Standard Deviation for the marks obtained by a student in monthly test in mathematic (out of 50) as 30, 35,25, 20, 15 is

(a) 25 (b) 50
(c) $\sqrt{50}$ (d) $\sqrt{30}$

72. If in a moderately skewed distribution the values of mode and mean are 32.1 and 35.4 respectively, then the value of the median is

(a) 33.3 (b) 34
(c) 34.3 (d) 33

73. If the standard deviation for the marks obtained by a student in monthly test is 36, then the variance is

(a) 36 (b) 6
(c) 1296 (d) None of the above

74. The median of the data 5, 6, 7, 7, 8, 9, 10, 11, 11, 12, 15, 18, 18 and 19 is

(a) 10 (b) 10.5
(c) 11.5 (d) 11

75. The means of 20 items of a data is 5 and if each item is multiplied by 3, then the new mean will be

(a) 20 (b) 5
(c) 15 (d) 10

76. The Geometric mean of 3, 6, 24 and 48 is

(a) 6 (b) 8
(c) 12 (d) 24

77. The Algebraic sum of the deviation of a set of values from their arithmetic mean is

(a) >0 (b) =0
(c) <0 (d) None of the above

78. Which one of the following is not a central tendency?

(a) Mean Deviation (b) Arithmetic mean
(c) Median (d) Mode

79. If the range of a set of values is 65 and maximum value in the set is 83, then the minimum value in the set is

(a) 74 (b) 9
(c) 18 (d) None of the above

80. The two lines of regression intersect at the point:

(a) Mean (b) Median
(c) Mode (d) None of the these

81. If the two lines of regression are $x + 2y - 5 = 0$ and $2x + 3y - 8 = 0$, then the regression line of y on x is

(a) $x + 2y - 5 = 0$ (b) $x + 2y = 0$
(c) $2x + 3y - 8 = 0$ (d) $2x + 3y = 0$

82. If the two regression lines are 3X = Y and 8Y = 6X, then the value of correlation coefficient is

(a) –0.5 (b) 0.5
(c) 0.75 (d) –0.80

83. The regression coefficient is independent of the change of

(a) Origin (b) Scale
(c) Scale and origin both (d) None of these

84. If the correlation coefficient between the variables X and Y is 0.5, then the correlation coefficient between the variables $2x - 4$ and $3 - 2y$ is

(a) 0.5 (b) 1
(c) –0.5 (d) 0

85. If $P(A)=\frac{1}{2}, P(B)=\frac{1}{3}, and\ P(A\cap B)=\frac{1}{4}\ then\ P(A\cup B)$ is equal to

(a) $\frac{11}{12}$ (b) $\frac{07}{12}$

(c) $\frac{10}{12}$ (d) $\frac{1}{6}$

86. Two different dice are thrown simultaneously , then the probability, that the sum of two numbers appearing on the top of dice is 9 is

(a) $\frac{1}{9}$ (b) $\frac{8}{9}$

(c) $\frac{7}{9}$ (d) None of the above

87. If (A U B) = 0.8 and P (A ̵ Ω B) = 0.3 then P($\bar{A}$) + P($\bar{B}$) is equal to:

(a) 0.3 (b) 0.5

(c) 0.9 (d) 0.7

88. The probability that a leap year has 53 Wednesday is

(a) $\frac{2}{7}$ (b) $\frac{3}{5}$

(c) $\frac{1}{7}$ (d) $\frac{2}{3}$

89. A coin is tossed six times, then the probability of obtaining heads and tails alternatively is

(a) $\frac{1}{2}$ (b) $\frac{1}{32}$

(c) $\frac{1}{64}$ (d) $\frac{1}{16}$

90. Ram is known to hit a target in 2 out of 3 shots where as Shyam is known to hit the same target in 5 out of 11 shots. What is the probability that the target would be hit if they both try?

(a) $\frac{9}{11}$ (b) $\frac{6}{11}$

(c) $\frac{10}{33}$ (d) $\frac{3}{11}$

91. For a Poisson variate X, P(X=2) = 3P (X = 4), then the standard deviation of X is

(a) 2 (b) 3

(c) 4 (d) $\sqrt{2}$

92. The mean of the Binomial distribution $B\left(4,\frac{1}{3}\right)$ is equal to

(a) $\frac{3}{5}$ (b) $\frac{4}{3}$

(c) $\frac{8}{3}$ (d) $\frac{3}{4}$

93. If for a normal distribution Q_1= 54.52 and Q = 78.86, then the median of the distribution is

(a) 12.17 (b) 66.69

(c) 39.43 (d) None of these

94. What is the mean of X having the following density function?

F(x)=$\frac{1}{4\sqrt{2x}}e^{\frac{(x-10)^2}{32}}$ for $-\infty < x < \infty$

(a) 4 (b) 10

(c) 40 (d) None of the above

95. The probability that a student is not a swimmer is 1/5, then the probability that out of five students four are swimmer is

(a) $\left(\frac{4}{5}\right)^4\left(\frac{1}{5}\right)$ (b) ${}^5C_1\left(\frac{1}{5}\right)^4\left(\frac{4}{5}\right)$

(c) ${}^5C_4\left(\frac{4}{5}\right)^4\left(\frac{1}{5}\right)$ (d) None of the above

96. Which of the following statement is true?

(a) Paache's Index Number is based on the base year quantity

(b) Fisher's Index Number is the Arithmetic Mean of Laspeyre's Index Number and Paache's Index Numbers

(c) Arithmetic Mean is the most appropriate average for constructing the index number

(d) Fisher's Index Number is an Ideal Index Number

97. If Laspeyre's Index Number is 250 and Paache's Index Number is 160. then Fisher's index number is:

(a) 40000 (b) $\frac{25}{16}$

(c) 200 (d) $\frac{16}{25}$

98. The simple average method is used to calculate:

(a) Trend Variation (b) Cyclical Variation

(c) Seasonal Variation (d) Irregular Variation

99. If $\sum P_0Q_0 = 240$, $\sum P_1Q_1 = 480$, $\sum P_1Q_0 = 600$ and $\sum P_0Q_1 = 192$, then Laspeyre's index number is:

(a) 250 (b) 300

(c) 350 (d) 200

100. The Sale of Cold Drink would go up in summers and go down in the winters is an example of:

(a) Trend Variation (b) Cyclical Variation

(c) Seasonal Variation (d) Irregular Variation